Part 135—Operating Requirements: Commuter and On-Demand Operations

This change incorporates Amendment 135–61, Extended Overwater Operations With a Single Long-Range Communication System (LRCS) and a Single Long-Range Navigation System (LRNS) adopted February 20 and effective February 26, 1996. Section 135.165 is affected by this amendment.

Bold brackets enclose the most recently changed or added material.

Page Control Chart

Remove Pages	Dated	Insert Pages	Dated
		P–747 through P–753	Ch. 10
Subpart C	—	Subpart C	Ch. 10

Suggest filing this transmittal at the beginning of the FAR. It will provide a method for determining that all changes have been received as listed in the current edition of AC 00–44, Status of Federal Aviation Regulations, and a check for determining if the FAR contains the proper pages.

SUMMARY: This action revises the Federal Aviation Regulations for certain overwater operations for air carriers, commercial operators, and general aviation operators of large and of turbine-powered multiengine airplanes. It defines and clarifies requirements for using long-range navigation systems (LRNS) and long-range communication systems (LRCS) and sets forth criteria for navigation and communication equipment for certain overwater operations. Under this rule, air carriers and commercial operators are authorized to use a single LRCS and a single LRNS for extended overwater routes detailed in their operations specifications. Affected general aviation operators, who already are authorized to use a single LRCS when they have two very high frequency (VHF) communication systems, are authorized to use a single LRNS in overwater operations in the Gulf of Mexico, the Caribbean Sea, and part of the western Atlantic Ocean. This rule gives the FAA greater flexibility in responding to advances in aviation technology and changes in the operational environment and allows operators to conduct extended overwater operations without carrying unnecessary communication and navigation equipment.

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SUPPLEMENTARY INFORMATION:

Background

Air traffic in the Gulf of Mexico, the Caribbean Sea, and part of the western Atlantic Ocean (subsequently referred to in this document as the geographic area) has increased substantially during the last 20 years. With this increase has come corresponding technological advances inherent with more modern aircraft and improved navigation and communications systems.

Advances in aircraft technology have increased the overall speed and functional reliability of modern airplanes. These high-speed airplanes can cover routes in the geographic area much more quickly than their predecessors. Because of their higher speeds, they also can cover greater distances during the time between hourly fixes. Thus, the number of routes in the geographic area where time between reliable fixes was 1 hour or more has been reduced for these airplanes. Similarly, the airplane's exposure to the loss of its LRNS before the next reliable fix can be obtained is reduced. Since such aircraft also routinely operate at higher altitudes en route, they can conduct very high frequency (VHF) communications at greater ranges from their corresponding ground facilities than their predecessors.

Advances in avionics have resulted in increasingly accurate and dependable navigation systems, using inputs from Loran C, Omega/very low frequency (VLF), inertial navigation, or reference systems (INS), and, most recently, the global positioning satellite navigation system (GPS). Each navigation system typically gives instantaneous readouts of position, ground speed, wind, and waypoint progress. Radio communication systems have enjoyed similar advances. Bulky vacuum tube units have given way to miniaturized units with transistors, precise frequency selection, and high reliability, which produce the same or greater transmitting power than older models. In addition, the proliferation of VHF communication facilities within the geographic area ensures that many routes now can be flown with a VHF communications gap of no more than 30 minutes.

The increased reliability of modern LRNS reduces navigation errors. Sophisticated flight management systems (FMS) integrate control and navigation systems of an airplane and combine several navigation inputs to provide greater position reliability. The multiple navigation inputs into an FMS increase the accuracy of the system, and its reliability when compared to earlier navigation systems which only received a single source input. If the LRNS fails on an airplane using such sophisticated equipment, navigation errors inherent in dead-reckoning procedures from the moment of the failure until the next reporting point or fix should be well within the navigational performance capability required for the route to be flown.

the affected airplane with some backup VHF communications with ATC. Moreover, regardless of the number of other aircraft in the area, if the flightcrew adheres to proper operational procedures, failure of the LRNS should not lead to an increased potential for conflict between aircraft before the airplane could come into range of suitable navigation aids (e.g. non-directional beacon, very high frequency omnirange (VOR), etc.).

Because of the increased speeds and higher altitudes at which airplanes now operate, improved equipment, improved reliability, and greater accuracy of LRNS systems, the FAA has concluded that, where exposure time for a critical equipment failure is 1 hour or less, the following is true:

- The probability of a failure is less than the probability of a failure with less modern equipment;
- With the accuracy of the present equipment, operators have better knowledge of their position if a failure does occur.

All of the factors discussed above have brought about the need to update the regulations to conform current technology to the types of operations that are currently being authorized. Namely, the FAA has found that operations in the geographic area can be conducted without the burden of additional navigation and communication systems carried in the aircraft. Therefore, on a case-by-case basis, and with certain conditions and limitations, the FAA has allowed a number of operators to conduct operations in the geographic area with a single LRCS and a single LRNS. To date, such operations have had no adverse effect on safety.

General Discussion of Current Requirements for Extended Overwater Operations

General Aviation Operations

With one exception, set forth in § 91.511(d), 14 Code of Federal Regulations part 91, subpart F, the FAA currently requires large and turbine-powered multiengine airplanes engaged in overwater operations to be equipped with two independent communication and two independent navigation systems. Communication equipment must be appropriate to the facilities to be used and able to transmit to and receive from at least one surface facility at any place on the route. Navigation equipment must be able to provide the pilot with the information necessary to navigate the airplane within the airspace assigned by ATC. Under the exception in § 91.511(d), if a route requires the use of both VHF and LRCS communication equipment, and the airplane has two VHF transmitters and two VHF receivers, then only one LRCS transmitter and one LRCS receiver is required for communications.

Air Carrier and Commercial Operations

Parts 121, 125, and 135 also require airplanes engaged in extended overwater operations to be equipped with two independent communication and two independent navigation systems. Like part 91, parts 125 and 135 require that the communication equipment be appropriate to the facilities to be used and capable of transmitting to and receiving from at least one ground facility at any place on the route. Although the regulatory language differs somewhat, part 121 contains essentially the same requirements for communication equipment. Specifically, part 121 requires two independent communication systems able to communicate, under normal operating conditions, with (1) at least one appropriate ground station from any point on the route and with (2) appropriate traffic control facilities from any point in the airspace within which the flights are intended. These communication systems also must be able to receive meteorological information from any point en route. Unlike part 91, however, parts 121, 125, and 135 do not allow the use of a single LRCS where the airplane is also equipped with two VHF radios or systems. Thus, if a route requires use of both VHF and LRCS, airplanes operating under parts 121, 125, and 135 must have two VHF radios and two LRCS.

Section 121.349(b) allows for the use of a single automatic direction finder (ADF) when two VOR navigation units are installed and VOR navigation aids are so located and the airplane is so fueled that, in the case of a failure of the ADF, the flight may proceed safely to a suitable airport by means of VOR aids. In all other cases, when use of ADF, VOR navigation equipment, or both, is needed

circumstances, the FAA may expand the areas in which operations with a single LRCS and a single LRNS will be permitted for part 121, 125, and 135 operators.

Aside from the current authority set forth in §§ 91.511(d) and 121.349(b), this rule does not change the general requirements under parts 91, 121, 125, and 135 for two VHF communication systems and two each of any appropriate navigation systems required for the route to be flown except in the geographic area. The FAA has concluded that, by maintaining these requirements, air transportation safety is not compromised.

The FAA is amending part 91 and creating operation specification authority for operators under parts 121, 125, and 135 based on the factors mentioned above and on the operator's ability to maintain two-way communications with ATC and, where appropriate, the certificate holder's dispatch office. Without such factors, ATC's ability to control airplanes in the geographic area would be adversely impacted, increasing the potential for air traffic conflicts. The flightcrew must be able to notify ATC of an LRNS failure and must be able to tell ATC whether the flightcrew can reliably fix the airplane's position using other means.

Part 91

As a result of changes in technology, the operational environment described, and experience gained with exemptions allowing a single LRNS, the FAA has concluded that part 91 operators of large and of turbojet multiengine airplanes should be able to operate safely with a single LRCS and a single LRNS in the geographic area. In conducting operations in the geographic area, these general aviation operators should consider how long they may be without two-way VHF communications. For flight planning purposes, the FAA recommends that this gap should not exceed 30 minutes. The operator also should consider whether the position of the airplane can be reliably fixed at least once each hour if the LRNS fails.

Parts 121, 125, and 135

The FAA believes that the only appropriate method for authorizing single LRCS/single LRNS operations for part 121, 125, and 135 certificate holders is through FAA-approved authorizations, which will be set forth in the certificate holder's operations specifications. This method of approval is necessary because it will provide both the FAA and the certificate holder greater flexibility in dealing with varied equipment configurations, possible reclassification of airspace operating areas, changes in navigational requirements, and changes in air traffic separation standards.

The FAA has authorized these operations in the past and has determined that controlling a VHF communication gap through operations specifications will provide an equivalent level of safety. Loss of the single LRNS still requires each operator to reliably fix the airplane's position at least once each hour if the flight is continued and to navigate within the required degree of accuracy over any authorized route.

Definition of LRNS and LRCS

In the proposal, the FAA defined an LRNS as an electronic navigation unit that is approved for use under instrument flight rules (IFR) as a primary means of navigation and has at least one source of navigational input, such as INS, Omega/very low frequency, and Loran C. In this definition, the FAA did not limit the scope of acceptable LRNS to radio-based or ground-based systems. Such nonradio, nonground-based systems as INS are included within the scope of acceptable alternatives as long as the system chosen has been approved for use under IFR. If approved, GPS or similar navigation systems also would fall within this definition. Where ADF or VOR radio navigation is impractical or unusable, the FAA interprets the current regulations to require the airplane to be equipped with two LRNS for extended overwater operations. This final rule changes this dual LRNS requirement. For parts 121, 125, and 135, authorization for a single LRNS and a single LRCS will be approved in the certificate holder's operations specifications. Since affected part 91 operators do not use operations specifications, they would be authorized to use a single LRNS, but only in the geographic area.

Because part 91 operators are not required to have operations specifications, this rule limits general aviation single LRNS operations to the geographic area. The areas of operation covered in this rule for affected general aviation operators include the Gulf of Mexico, the Caribbean Sea, and the Atlantic Ocean west of a line which extends from 44°47′00″ N / 67°00′00″ W to 39°00′00″ N / 67°00′00″ W to 38°30′00″ N /60°00′00″ W south along the 60°00′00″ W longitude line to the point where the line intersects with the northern coast of South America. This geographic area does not include the North Atlantic Minimum Navigational Performance Specifications (NAT/MNPS) airspace, where operations are governed by § 91.705 and appendix C to part 91.

Limitations for air carrier and commercial operations will be set forth in the certificate holders' operations specifications. As in the case of general aviation operations, the area of operation for air carrier and commercial operators will not include NAT/MNPS airspace. At a minimum, these operators must always comply with International Civil Aviation Organization (ICAO) requirements for the area of operations.

Discussion of Comments

On October 5, 1993, the FAA published a notice proposing to allow extended overwater operations with single LRCS and single LRNS (58 FR 51938). The FAA received six comments on the proposal. The National Business Aircraft Association, Inc. (NBAA), the Aircraft Owners and Pilots Association (AOPA), and the Air Transport Association (ATA) expressed support with recommendations. Northwest Airlines expressed neither support nor opposition but did provide a recommendation. The Boeing Commercial Airplane Group acknowledged the proposal but had ''no comment'' and an aviation consulting firm was opposed to the proposal. These comments are discussed as follows:

NBAA

The NBAA indicated that it ''strongly supports'' the proposed changes to allow single LRNS and LRCS. It recommended, however, that proposed § 121.99 be incorporated into parts 91, 125, and 135 since these parts also require the latitude to access new technology communication links without being tied solely to HF.

FAA Response: This rule is intended to affect use of LRNS and LRCS for extended overwater operations. The FAA recognizes that additional updates to the rules are needed in view of advances in technology, such as GPS. Such changes will be addressed in future rulemaking initiatives.

AOPA

AOPA supported the proposal and recommended that the requirement for an LRCS be eliminated entirely for certain aircraft in flight conditions where no more than a 30-minute gap in two-way communications exists. AOPA supported its recommendation by stating that LRCS equipment is cumbersome and expensive. According to the commenter, LRCS equipment is often adversely affected by precipitation and other weather conditions. Further, in overwater areas, pilots relay transmissions to ATC through other aircraft and do not depend on their LRCS.

FAA Response: The FAA acknowledges that an LRCS has some disadvantages; however, these disadvantages are offset by the necessity for communications when an airplane is operating in extended overwater beyond the range of VHF ground-based communications. While airplanes operating in accordance with § 91.511 are not involved in the carriage of persons or cargo for compensation or hire, these airplanes nevertheless share airspace in the geographic area with air carriers which are engaged in transporting passengers and cargo. Therefore, the FAA considers it necessary for safety that all aircraft operating in the geographic area be able to communicate with ATC at all times.

Northwest Airlines

Northwest Airlines suggested that the proposed rule be amended to allow operations in NAT/MNPS airspace for flights to and from SLATIN along or west of A632. According to the commenter, the area of NAT/MNPS airspace traversed by A632 is within VHF coverage except for an area of non-coverage located on either side of the mid point of A632 between Bermuda and the mainland of the U.S. The commenter asserted that this non-coverage area can be traversed within 6 minutes. Northwest further indicated that extending the boundary of the area below 27°00′00″ N from longitude 60°00′00″ N to 58°00′00″ W, would include the island of Barbados and thereby preclude any confusion regarding coverage of the total Caribbean island chain. Lastly, Northwest indicated that the coordinates describing operations under part 91 do not have the same boundaries as defined by part 91, appendix C. According to the commenter, this presents confusion to ATC with respect to the different requirements for air carrier and general aviation operations.

FAA Response: The route from SLATIN along A632 to approximate 38°30′00″ N and 67°30′00″ W is NAT/MNPS airspace and, as such, is governed by ICAO agreements which require redundant navigation and communication systems. It is not within the scope (authority) of this rule to alter those agreements. This airspace represents an extremely small part of the total geographic area considered in this rule and can be crossed in 6 minutes by a turbine-powered air transport category airplane. Airlines may operate through this airspace with one LRNS and one LRCS provided they obtain a letter of agreement with ATC. These operations have been successful in the past and the FAA does not consider it to be in the public interest for the U.S. government to file a difference with ICAO.

The boundaries defined in the rule represent a general oceanic area, outside NAT/MNPS airspace, in which a single LRNS and single LRCS may be used when an airplane is unable to navigate by reference to standard ICAO navigational aids such as VOR or ADF. The location of the island of Barbados outside the western boundary of the geographic area does not exclude it from operations conducted under this regulation since VOR coverage extends well into the geographic area.

The commenter's concern regarding possible conflict between the requirements of part 91, appendix C and the boundaries of the geographic area of the rule is unfounded. Part 91, appendix C refers to operations within NAT/MNPS airspace whereas the regulation limits operation to airspace outside NAT/MNPS airspace.

Aviation Consulting Firm

George Rabe & Associates, the aviation consulting firm opposed to the proposal indicated that some of the more modern communication and navigation systems are an improvement; however, some are not. Nonetheless, according to the commenter, since smaller airlines cannot afford to purchase the more expensive communication and navigation systems, they do not have the luxury of operating with enhanced accuracy and reliability provided by the more sophisticated systems. This commenter stated that the economic arguments of the proposal are not justified given that GPS is expected to bring down costs and that some operators will still conduct operations requiring the use of dual LRNS and LRCS. Moreover, according to this commenter, increased air traffic and reduced separation standards should bring forth a requirement for improved navigation safety not a reduction in safety standards. Indicating that errors are not mechanical but human, this commenter recommended maintaining the requirement for dual LRNS and LRCS and also improving training requirements.

FAA Response: The FAA realizes that cost differences exist among LRNS and LRCS equipment and that there may be some differences in accuracy; however, all equipment used for operations under this rule must meet certain standards of approval established by the FAA. These standards serve to assure that an acceptable level of safety is maintained regardless of the cost and availability of the equipment.

Economic Summary

This final rule reduces costs to operators by eliminating the requirements for two LRCS and two LRNS in the Gulf of Mexico, part of the western Atlantic Ocean, and the Caribbean Sea (the geographic area). Savings will come from reduced avionics costs, reduced fuel consumption from less aircraft weight, and reduced risk of flight cancellations due to inoperative equipment.

The FAA estimates the fleet size operating in the geographic area will be approximately 158 airplanes in 1995. The FAA assumes that the size of the fleet serving the geographic area will grow by 5.5 percent annually over the 10-year period, 1995–2004. Although the fleet composition varies from jumbo jets to smaller twin-engine turboprop planes, commercial operators most often use Boeing 727's in the geographic area. In addition to the scheduled commercial fleet, general aviation and non-commercial operators operating in the geographic area will gain some relief from this rule as well. The FAA, however, does not have an accurate measure of the size of the fleet operating in the geographic area.

Each commercial operator will save approximately $17,000 per airplane in equipment costs and will reduce aircraft weight 20 pounds per airplane by eliminating one LRCS; each commercial operator will save about $36,000 per airplane in equipment costs and will reduce aircraft weight 20 pounds per airplane by eliminating one LRNS. For existing airplanes with equipment made redundant by this rule, the resulting avionics cost savings will total about $53,000 per converted airplane. The FAA also estimates that each additional pound on an airplane costs an operator an additional 15 gallons of fuel annually. Assuming a converted airplane removes two 20-pound pieces of equipment, the reduction in weight will save 600 gallons of fuel each year. Using a 1993 average jet fuel price of $.675 per gallon, the reduction in weight of 600 gallons of fuel per year will result in annual savings totaling over $400 per converted airplane.

Additional savings from the rule will also come from reduced flight cancellations as operators experience fewer equipment failures as a result of the reduced equipment requirements. Cost reduction resulting from the prevention of a cancellation depends on passenger time, passenger handling costs, lost revenue, and operating costs. The approximate cost of a Boeing 727 cancellation is estimated to equal just over $28,000. The FAA, however, does not have an accurate estimate for the number of flight cancellations attributable to non-functioning LRCS or LRNS for airplanes operating in the geographic area from which to estimate the total cost savings resulting from reduced cancellations.

The FAA assumes that 50 percent of the commercial fleet serving the geographic area will reduce the equipment in its airplanes to only one LRCS and one LRNS, and that this conversion will occur during the first 2 years after implementation of the rule. Thereafter, the FAA assumes that one-half the airplanes added to the commercial fleet will be placed in service with only one LRCS and one LRNS. The FAA further assumes that the savings resulting from reduced fuel expenditure applies to the equipment conversion of 50 percent of the fleet converting to a single LRCS and a single LRNS.

In each of the first 2 years after the rule becomes effective, the industry will reduce avionics costs by over $2 million. Over the decade 1995–2004, the total savings in 1993 dollars for reduced avionics requirements will exceed $6.7 million. The fuel savings resulting from airplane weight reduction will add another $389,000 in reduced costs, bringing the total cost savings in 1993 dollars for this final rule to more than $7.1 million. The net discounted savings for the decade 1995–2004, will total just over $5.7 million.

The FAA has determined that no safety problem exists with the reduction in requirements for dual LRCS and dual LRNS for certain overwater operations. In the past two decades, the FAA has granted limited exemption from the requirements for dual LRCS and LRNS to certain qualified operators operating in the geographic area. No airplane operating under exemption has had an accident which can be attributed to having only one LRCS or one LRNS. During that time, the accuracy and reliability of navigation equipment has continuously improved. Thus, the FAA believes that this rule presents no degradation in aviation safety in the geographic area.

may have "a significant economic impact on a substantial number of small entities."

FAA criteria define "a substantial number" as not less than eleven nor more than one-third of the small entities subject to the rule. Among air carriers, a small entity is defined as one which owns, but does not necessarily operate, nine or fewer aircraft. The criteria define "a significant impact" as follows: $102,000 for scheduled air carriers with 60 or more seats; $57,000 for scheduled air carriers with fewer than 60 seats.

This amendment is wholly cost relieving. By eliminating the need for two LRCS and LRNS in the geographic area, the estimated cost savings to an operator is $53,000. This savings is less than the threshold amount for small, scheduled operators.

Federalism Implications

The regulations adopted herein will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this rule would not have federalism implications requiring the preparation of a Federalism Assessment.

International Civil Aviation Organization and Joint Aviation Regulations

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with ICAO Standards and Recommended Practices (SARP) to the maximum extent practicable. For this amendment, the FAA has reviewed the SARP of Annex 6, Parts I and II, applicable to international commercial air transportation operations and international general aviation operations respectively. The FAA has determined that this rule would not present any differences.

Paperwork Reduction Act

This rule contains no information collection requests requiring approval of the Office of Management and Budget pursuant to the Paperwork Reduction Act (44 U.S.C. 3507 *et seq.*).

Conclusion

For the reasons discussed in the preamble, and based on the findings in the Regulatory Flexibility Determination and the International Trade Impact Statement, the FAA has determined that this regulation is not significant under Executive Order 12866. In addition, it is certified that this rule will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. This rule is not significant under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979).

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends 14 CFR parts 1, 91, 121, 125, and 135 effective February 26, 1996.

The authority citation for part 135 continues to read as follows:

Authority: 49 U.S.C. 106(g), 1153, 40101, 40105, 44113, 44701–44705, 44707–44717, 44722, and 45303.

Subpart C—Aircraft and Equipment

§ 135.141 Applicability.

This subpart prescribes aircraft and equipment requirements for operations under this part. The requirements of this subpart are in addition to the aircraft and equipment requirements of part 91 of this chapter. However, this part does not require the duplication of any equipment required by this chapter.

§ 135.143 General requirements.

(a) No person may operate an aircraft under this part unless that aircraft and its equipment meet the applicable regulations of this chapter.

(b) Except as provided in § 135.179, no person may operate an aircraft under this part unless the required instruments and equipment in it have been approved and are in an operable condition.

(c) ATC transponder equipment installed within the time periods indicated below must meet the performance and environmental requirements of the following TSO's.

(1) *Through January 1, 1992:*

(i) Any class of TSO–C74b or any class of TSO–C74c as appropriate, provided that the equipment was manufactured before January 1, 1990; or

(ii) The appropriate class of TSO–C112 (Mode S).

(2) *After January 1, 1992:* The appropriate class of TSO–C112 (Mode S). For purposes of paragraph (c)(2) of this section, "installation" does not include—

(i) Temporary installation of TSO–C74b or TSO–C74c substitute equipment, as appropriate, during maintenance of the permanent equipment;

(ii) Reinstallation of equipment after temporary removal for maintenance; or

(iii) For fleet operations, installation of equipment in a fleet aircraft after removal of the equipment for maintenance from another aircraft in the same operator's fleet.

(Amdt. 135–22, Eff. 5/26/87)

§ 135.145 Aircraft proving tests.

(a) No certificate holder may operate a turbojet airplane, or an aircraft for which two pilots are required by this chapter for operations under VFR, if it has not previously proved that aircraft or an aircraft of the same make and similar design in any operation under this part unless, in addition to the aircraft certification tests, at least 25 hours of proving tests acceptable to the Administrator have been flown by that certificate holder including—

(1) Five hours of night time, if night flights are to be authorized;

(2) Five instrument approach procedures under simulated or actual instrument weather conditions, if IFR flights are to be authorized; and

(3) Entry into a representative number of en route airports as determined by the Administrator.

(b) No certificate holder may carry passengers in an aircraft during proving tests, except those needed to make the tests and those designated by the Administrator to observe the tests. However, pilot flight training may be conducted during the proving tests.

(c) For the purposes of paragraph (a) of this section, an aircraft is not considered to be of similar design if an alteration includes—

(1) The installation of powerplants other than those of a type similar to those with which it is certificated; or

(2) Alterations to the aircraft or its components that materially affect flight characteristics.

(d) The Administrator may authorize deviations from this section if the Administrator finds that special circumstances make full compliance with this section necessary.

§ 135.147 Dual controls required.

No person may operate an aircraft in operations requiring two pilots unless it is equipped with functioning dual controls. However, if the aircraft type certification operating limitations do not require two pilots, a throwover control wheel may be used in place of two control wheels.

source;

(c) For turbojet airplanes, in addition to two gyroscopic bank-and-pitch indicators (artificial horizons) for use at the pilot stations, a third indicator that is installed in accordance with the instrument requirements prescribed in § 121.305(j) of this chapter.

(d) [Reserved]

(e) For turbine-powered aircraft, any other equipment as the Administrator may require.

(Amdt. 135–1, Eff. 5/7/79); (Amdt. 135–34, Eff. 11/27/89); (Amdt. 135–38, Eff. 11/26/90)

§ 135.150 Public address and crewmember interphone systems.

No person may operate an aircraft having a passenger seating configuration, excluding any pilot seat, of more than 19 unless it is equipped with—

(a) A public address system which—

(1) Is capable of operation independent of the crewmember interphone system required by paragraph (b) of this section, except for handsets, headsets, microphones, selector switches, and signaling devices;

(2) Is approved in accordance with § 21.305 of this chapter;

(3) Is accessible for immediate use from each of two flight crewmember stations in the pilot compartment;

(4) For each required floor-level passenger emergency exit which has an adjacent flight attendant seat, has a microphone which is readily accessible to the seated flight attendant, except that one microphone may serve more than one exit, provided the proximity of the exits allows unassisted verbal communication between seated flight attendants;

(5) Is capable of operation within 10 seconds by a flight attendant at each of those stations in the passenger compartment from which its use is accessible;

(6) Is audible at all passenger seats, lavatories, and flight attendant seats and work stations; and

devices;

(2) Is approved in accordance with § 21.305 of this chapter;

(3) Provides a means of two-way communication between the pilot compartment and—

(i) Each passenger compartment; and

(ii) Each galley located on other than the main passenger deck level;

(4) Is accessible for immediate use from each of two flight crewmember stations in the pilot compartment;

(5) Is accessible for use from at least one normal flight attendant station in each passenger compartment;

(6) Is capable of operation within 10 seconds by a flight attendant at each of those stations in each passenger compartment from which its use is accessible; and

(7) For large turbojet-powered airplanes—

(i) Is accessible for use at enough flight attendant stations so that all floor-level emergency exits (or entryways to those exits in the case of exits located within galleys) in each passenger compartment are observable from one or more of those stations so equipped;

(ii) Has an alerting system incorporating aural or visual signals for use by flight crewmembers to alert flight attendants and for use by flight attendants to alert flight crewmembers;

(iii) For the alerting system required by paragraph (b)(7)(ii) of this section, has a means for the recipient of a call to determine whether it is a normal call or an emergency call; and

(iv) When the airplane is on the ground, provides a means of two-way communication between ground personnel and either of at least two flight crewmembers in the pilot compartment. The interphone system station for use by ground personnel must be so located that personnel using the system may avoid visible detection from within the airplane.

Docket No. 24995 (54 FR 43926) Eff. 10/27/89 (Amdt. 135–34, Eff. 11/27/89)

23.1457(a)(1) and (2), (b), (c), (d), (e), (f), and (g); § 25.1457(a)(1) and (2), (b), (c), (d), (e), (f), and (g); § 27.1457(a)(1) and (2), (b), (c), (d), (e), (f), and (g); § 29.1457(a)(1) and (2), (b), (c), (d), (e), (f), and (g); of this chapter, as applicable; and

(2) Is operated continuously from the use of the check list before the flight to completion of the final check list at the end of the flight.

(b) [No] person may operate a multiengine, turbine-powered airplane or rotorcraft having a passenger seating configuration of 20 or more seats unless it is equipped with an approved cockpit voice recorder that—

(1) Is installed in compliance with § 23.1457, § 25.1457, § 27.1457 or § 29.1457 of this chapter, as applicable; and

(2) Is operated continuously from the use of the check list before the flight to completion of the final check list at the end of the flight.

(c) In the event of an accident, or occurrence requiring immediate notification of the National Transportation Safety Board which results in termination of the flight, the certificate holder shall keep the recorded information for at least 60 days or, if requested by the Administrator or the Board, for a longer period. Information obtained from the record may be used to assist in determining the cause of accidents or occurrences in connection with investigations. The Administrator does not use the record in any civil penalty or certificate action.

(d) For those aircraft equipped to record the uninterrupted audio signals received by a boom or a mask microphone the flight crewmembers are required to use the boom microphone below 18,000 feet mean sea level. No person may operate a large turbine-engine-powered airplane manufactured after October 11, 1991, or on which a cockpit voice recorder has been installed after October 11, 1991, unless it is equipped to record the uninterrupted audio signal received by a boom or mask microphone in accordance with § 25.1457(c)(5) of this chapter.

(e) In complying with this section, an approved cockpit voice recorder having an erasure feature

ated.

(Amdt. 135–23, Eff. 5/26/87); (Amdt. 135–26, Eff. 10/11/88); [(Amdt. 135–60, Eff. 2/26/96)]

§ 135.152 Flight recorders.

(a) No person may operate a multiengine, turbine-powered airplane or rotorcraft having a passenger seating configuration, excluding any pilot seat, of 10 to 19 seats, that is brought onto the U.S. register after October 11, 1991, unless it is equipped with one or more approved flight recorders that utilize a digital method of recording and storing data, and a method of readily retrieving that data from the storage medium. The parameters specified in appendix B or C, as applicable, of this part must be recorded within the range, accuracy, resolution, and recording intervals as specified. The recorder shall retain no less than 8 hours of aircraft operation.

(b) After October 11, 1991, no person may operate a multiengine, turbine-powered airplane having a passenger seating configuration of 20 to 30 seats or a multiengine, turbine-powered rotorcraft having a passenger seating configuration of 20 or more seats unless it is equipped with one or more approved flight recorders that utilize a digital method of recording and storing data, and a method of readily retrieving that data from the storage medium. The parameters in appendix D or E of this part, as applicable, that are set forth below, must be recorded within the ranges, accuracies, resolutions, and sampling intervals as specified:

(1) Except as provided in paragraph (b)(3) of this section for aircraft type certificated before October 1, 1969, the following parameters must be recorded:

(i) Time;

(ii) Altitude;

(iii) Airspeed;

(iv) Vertical acceleration;

(v) Heading;

(vi) Time of each radio transmission to or from air traffic control;

(vii) Pitch attitude;

(viii) Roll attitude;

(i) Time;

(ii) Altitude;

(iii) Airspeed;

(iv) Vertical acceleration;

(v) Heading;

(vi) Time of each radio transmission either to or from air traffic control;

(vii) Pitch attitude;

(viii) Roll attitude;

(ix) Longitudinal acceleration;

(x) Pitch trim position;

(xi) Control column or pitch control surface position;

(xii) Control wheel or lateral control surface position;

(viii) Rudder pedal or yaw control surface position;

(xiv) Thrust of each engine;

(xv) Position of each thrust reverser;

(xvi) Trailing edge flap or cockpit flap control position; and

(xvii) Leading edge flap or cockpit flap control position.

(3) For aircraft manufactured after October 11, 1991, all of the parameters listed in appendix D or E of this part, as applicable, must be recorded.

(c) Whenever a flight recorder required by this section is installed, it must be operated continuously from the instant the airplane begins the takeoff roll or the rotorcraft begins the lift-off until the airplane has completed the landing roll or the rotorcraft has landed at its destination.

(d) Except as provided in paragraph (c) of this section, and except for recorded data erased as authorized in this paragraph, each certificate holder shall keep the recorded data prescribed in paragraph (a) of this section until the aircraft has been operating for at least 8 hours of the operating time specified in paragraph (c) of this section. In addition, each certificate holder shall keep the recorded data prescribed in paragraph (b) of this section for an airplane until the airplane has been operating for at least 25 hours, and for a rotorcraft until the rotorcraft has been this section, no record need be kept more than 60 days.

(e) In the event of an accident or occurrence that requires that immediate notification of the National Transportation Safety Board under 49 CFR part 830 of its regulations and that results in termination of the flight, the certificate holder shall remove the recording media from the aircraft and keep the recorded data required by paragraphs (a) and (b) of this section for at least 60 days or for a longer period upon request of the Board or the Administrator.

(f) Each flight recorder required by this section must be installed in accordance with the requirements of §§ 23.1459, 25.1459, 27.1459, or 29.1459, as appropriate, of this chapter. The correlation required by paragraph (c) of §§ 23.1459, 25.1459, 27.1459, or 29.1459, as appropriate, of this chapter need be established only on one aircraft of a group of aircraft:

(1) That are of the same type;

(2) On which the flight recorder models and their installations are the same; and

(3) On which there are no differences in the type design with respect to the installation of the first pilot's instruments associated with the flight recorder. The most recent instrument calibration, including the recording medium from which this calibration is derived, and the recorder correlation must be retained by the certificate holder.

(g) Each flight recorder required by this section that records the data specified in paragraphs (a) and (b) of this section must have an approved device to assist in locating that recorder under water.

Docket No. 25530 (53 FR 26151) Eff. 7/11/88; (Amdt. 135–26, Eff. 10/11/88)

§ 135.153 Ground proximity warning system.

[(a) Except as provided in paragraph (b) of this section, no person may operate a turbine-powered airplane having a passenger seating configuration, excluding any pilot seat, of 10 seats or more, unless

(1) The system must have been approved by the Administrator;

(2) The system must have a means of alerting the pilot when a malfunction occurs in the system; and

(3) Procedures must have been established by the certification holder to ensure that the performance of the system can be appropriately monitored.

(c) For a system required by this section, the Airplane Flight Manual shall contain—

(1) Appropriate procedures for—

(i) The use of the equipment;

(ii) Proper flight crew action with respect to the equipment; and

(iii) Deactivation for planned abnormal and emergency conditions; and

(2) An outline of all input sources that must be operating.

(d) No person may deactivate a system required by this section except under procedures in the Airplane Flight Manual.

(e) Whenever a system required by this section is deactivated, an entry shall be made in the airplane maintenance record that includes the date and time of deactivation.

(Amdt. 135–6, Eff. 9/10/80); (Amdt. 135–33, Eff. 10/25/89); (Amdt. 135–42, Eff. 4/20/92); [(Amdt. 135–60, Eff. 2/26/96)]

§ 135.155 Fire extinguishers: Passenger-carrying aircraft.

No person may operate an aircraft carrying passengers unless it is equipped with hand fire extinguishers of an approved type for use in crew and passenger compartments as follows—

(a) The type and quantity of extinguishing agent must be suitable for all the kinds of fires likely to occur;

(b) At least one hand fire extinguisher must be provided and conveniently located on the flight deck for use by the flight crew; and

(c) At least one hand fire extinguisher must be conveniently located in the passenger compartment of each aircraft having a passenger seating configu-

oxygen dispensers and oxygen to supply the pilots under § 135.89(a) and to supply, when flying—

(1) At altitudes above 10,000 feet through 15,000 feet MSL, oxygen to at least 10 percent of the occupants of the aircraft, other than the pilots, for that part of the flight at those altitudes that is of more than 30 minutes duration; and

(2) Above 15,000 feet MSL oxygen to each occupant of the aircraft other than the pilots.

(b) *Pressurized aircraft.* No person may operate a pressurized aircraft

(1) At altitudes above 25,000 feet MSL, unless at least a 10-minute supply of supplemental oxygen is available for each occupant of the aircraft, other than the pilots, for use when a descent is necessary due to loss of cabin pressurization; and

(2) Unless it is equipped with enough oxygen dispensers and oxygen to comply with paragraph (a) of this section whenever the cabin pressure altitude exceeds 10,000 feet MSL and, if the cabin pressurization fails, to comply with § 135.89(a) or to provide a 2-hour supply for each pilot, whichever is greater, and to supply when flying—

(i) At altitudes above 10,000 feet through 15,000 feet MSL, oxygen to at least 10 percent of the occupants of the aircraft, other than the pilots, for that part of the flight at those altitudes that is of more than 30 minutes duration; and

(ii) Above 15,000 feet MSL, oxygen to each occupant of the aircraft, other than the pilots, for one hour unless, at all times during flight above that altitude, the aircraft can safely descend to 15,000 feet MSL within four minutes, in which case only a 30-minute supply is required.

(c) The equipment required by this section must have a means—

(1) To enable the pilots to readily determine, in flight, the amount of oxygen available in each source of supply and whether the oxygen is being delivered to the dispensing units; or

(2) In the case of individual dispensing units, to enable each user to make those determinations

section, after April 12, 1981, no person may operate a transport category airplane equipped with a flight instrument pitot heating system unless the airplane is also equipped with an operable pitot heat indication system that complies with § 25.1326 of this chapter in effect on April 12, 1978.

(b) A certificate holder may obtain an extension of the April 12, 1981, compliance date specified in paragraph (a) of this section, but not beyond April 12, 1983, from the Director, Flight Standards Service if the certificate holder—

(1) Shows that due to circumstances beyond its control it cannot comply by the specified compliance date; and

(2) Submits by the specified compliance date a schedule for compliance, acceptable to the Director, indicating that compliance will be achieved at the earliest practicable date.

(Amdt. 135–17, Eff. 9/30/81); (Amdt. 135–33, Eff. 10/25/89)

§ 135.159 Equipment requirements: Carrying passengers under VFR at night or under VFR over-the-top conditions.

No person may operate an aircraft carrying passengers under VFR at night or under VFR over-the-top unless it is equipped with—

(a) A gyroscopic rate-of-turn indicator except on the following aircraft:

(1) Airplanes with a third attitude instrument system usable through flight attitudes of 360 degrees of pitch-and-roll and installed in accordance with the instrument requirements prescribed in § 121.3056) of this chapter.

(2) Helicopters with a third attitude instrument system usable through flight attitudes of ±80 degrees of pitch and ±120 degrees of roll and installed in accordance with § 29.1303(g) of this chapter.

(3) Helicopters with a maximum certificated takeoff weight of 6,000 pounds or less.

(b) A slip skid indicator.

(c) A gyroscopic bank-and-pitch indicator.

(d) A gyroscopic direction indicator.

rays of which are shielded from the pilot's eyes, and

(3) A flashlight having at least two size "D" cells or equivalent.

(g) For the purpose of paragraph (e) of this section, a continuous in-flight electrical load includes one that draws current continuously during flight, such as radio equipment, electrically driven instruments and lights, but does not include occasional intermittent loads.

(h) Notwithstanding provisions of paragraphs (b), (c), and (d), helicopters having a maximum certificated takeoff weight of 6,000 pounds or less may be operated until January 6, 1988, under visual flight rules at night without a slip skid indicator, a gyroscopic bank-and-pitch indicator, or a gyroscopic direction indicator.

Docket No. 24550 (51 FR 40709) Eff. 11/7/86);

(Amdt. 135–20, Eff. 1/6/87); (Amdt. 135–38, Eff. 11/26/90)

§ 135.161 Radio and navigational equipment: Carrying passengers under VFR at night or under VFR over-the-top.

(a) No person may operate an aircraft carrying passengers under VFR at night, or under VFR over-the-top, unless it has two-way communications equipment able, at least in flight, to transmit to, and receive from, ground facilities 25 miles away.

(b) No person may operate an aircraft carrying passengers under VFR over-the-top unless it has radio navigational equipment able to receive radio signals from the ground facilities to be used.

(c) No person may operate an airplane carrying passengers under VFR at night unless it has radio navigational equipment able to receive radio signals from the ground facilities to be used.

§ 135.163 Equipment requirements: Aircraft carrying passengers under IFR.

No person may operate an aircraft under IFR, carrying passengers, unless it has—

(a) A vertical speed indicator;

(b) A free-air temperature indicator;

(f) For a single-engine aircraft, a generator or generators able to supply all probable combinations of continuous inflight electrical loads for required equipment and for recharging the battery;

(g) For multiengine aircraft, at least two generators each of which is on a separate engine, of which any combination of one-half of the total number are rated sufficiently to supply the electrical loads of all required instruments and equipment necessary for safe emergency operation of the aircraft except that for multiengine helicopters, the two required generators may be mounted on the main rotor drive train; and

(h) Two independent sources of energy (with means of selecting either), of which at least one is an engine-drive pump or generator, each of which is able to drive all gyroscopic instruments and installed so that failure of one instrument or source does not interfere with the energy supply to the remaining instruments or the other energy source, unless, for single-engine aircraft, the rate-of-turn indicator has a source of energy separate from the bank and pitch and direction indicators. For the purpose of this paragraph, for multiengine aircraft, each engine-driven source of energy must be on a different engine.

(i) For the purpose of paragraph (f) of this section, a continuous inflight electrical load includes one that draws current continuously during flight, such as radio equipment, electrically driven instruments, and lights, but does not include occasional intermittent loads.

§ 135.165 Radio and navigational equipment: Extended overwater or IFR operations.

(a) No person may operate a turbojet airplane having a passenger seating configuration, excluding any pilot seat, of 10 seats or more, or a multiengine airplane in a commuter operation, as defined in part 119 of this chapter, under IFR or in extended overwater operations unless it has at least the following radio communication and navigational equipment appropriate to the facilities to be used which are capable of transmitting to and receiving that specified in paragraph (a) of this section, under IFR or in extended overwater operations unless it has at least the following radio communication and navigational equipment appropriate to the facilities to be used and which are capable of transmitting to, and receiving from, at any place on the route, at least one ground facility:

(1) A transmitter, (2) two microphones, (3) two headsets or one headset and one speaker, (4) a marker beacon receiver, (5) two independent receivers for navigation, (6) two independent receivers for communications, and (7) for extended overwater operations only, an additional transmitter.

(c) For the purpose of paragraphs (a)(5), (a)(6), (b)(5), and (b)(6) of this section, a receiver is independent if the function of any part of it does not depend on the functioning of any part of another receiver. However, a receiver that can receive both communications and navigational signals may be used in place of a separate communications receiver and a separate navigational signal receiver.

[(d) Notwithstanding the requirements of paragraphs (a) and (b) of this section, installation and use of a single long-range navigation system and a single long-range communication system, for extended overwater operations, may be authorized by the Administrator and approved in the certificate holder's operations specifications. The following are among the operational factors the Administrator may consider in granting an authorization: (1) the ability of the flightcrew to reliably fix the position of the airplane within the degree of accuracy required by ATC, (2) the length of the route being flown, and (3) the duration of the very high frequency communications gap.]

(Amdt. 135–58, Eff. 1/19/96); [(Amdt. 135–61, Eff. 2/26/96)]

§ 135.167 Emergency equipment: Extended overwater operations.

(a) No person may operate an aircraft in extended overwater operations unless it carries, installed in conspicuously marked locations easily accessible to the occupants if a ditching occurs, the following equipment:

this section must be equipped with or contain at least the following:

(1) One approved survivor locator light.

(2) One approved pyrotechnic signaling device.

(3) Either—

(i) One survival kit, appropriately equipped for the route to be flown; or

(ii) One canopy (for sail, sunshade, or rain catcher);

(iii) One radar reflector;

(iv) One life raft repair kit;

(v) One bailing bucket;

(vi) One signaling mirror;

(vii) One police whistle;

(viii) One raft knife;

(ix) One CO_2 bottle for emergency inflation;

(x) One inflation pump;

(xi) Two oars;

(xii) One 75-foot retaining line;

(xiii) One magnetic compass;

(xiv) One dye marker;

(xv) One flashlight having at least two size "D" cells or equivalent;

(xvi) A two-day supply of emergency food rations supplying at least 1,000 calories a day for each person;

(xvii) For each two persons the raft is rated to carry, two pints of water or one sea water desalting kit;

(xviii) One fishing kit; and

(xix) One book on survival appropriate for the area in which the aircraft is operated.

(c) [No person may operate an airplane in extended overwater operations unless there is attached to one of the life rafts required by paragraph (a) of this section, an approved survival type emergency locator transmitter. Batteries used in this transmitter must be replaced (or recharged, if the batteries are rechargeable) when the transmitter has been in use for more than 1 cumulative hour, or, when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter manufacturer under its approval. The new expiration date for replacing (or recharging)

§ 135.169 Additional airworthiness requirements.

(a) [Except for commuter category airplanes, no person may operate a large airplane unless it meets the additional airworthiness requirements of §§ 121.213 through 121.283 and 121.307 of this chapter.]

(b) No person may operate a reciprocating-engine or turbopropeller-powered small airplane that has a passenger seating configuration, excluding pilot seats, of 10 seats or more unless it is type certificated—

(1) In the transport category;

(2) Before July 1, 1970, in the normal category and meets special conditions issued by the Administrator for airplanes intended for use in operations under this part;

(3) Before July 19, 1970, in the normal category and meets the additional airworthiness standards in Special Federal Aviation Regulation No. 23;

(4) In the normal category and meets the additional airworthiness standards in appendix A;

(5) In the normal category and complies with section 1.(a) of Special Federal Aviation Regulation No. 41;

(6) In the normal category and complies with section 1.(b) of Special Federal Aviation Regulation No. 41; or

(7) In the commuter category.

(c) No person may operate a small airplane with a passenger seating configuration, excluding any pilot seat, of 10 seats or more, with a seating configuration greater than the maximum seating configuration used in that type airplane in operations under this part before August 19, 1977. This paragraph does not apply to—

(1) An airplane that is type certificated in the transport category; or

(2) An airplane that complies with—

(i) Appendix A of this part provided that its passenger seating configuration, excluding pilot seats, does not exceed 19 seats; or

ing and sidewall panels which are constructed of:

(i) Glass fiber reinforced resin;

(ii) Materials which meet the test requirements of part 25, appendix F, part III of this chapter; or

(iii) In the case of liner installations approved prior to March 20, 1989, aluminum.

(2) For compliance with this paragraph, the term "liner" includes any design feature, such as a joint or fastener, which would affect the capability of the liner to safely contain a fire.

(Amdt. 135–2, Eff. 10/17/79); (Amdt. 135–21, Eff. 2/17/87); (Amdt. 135–31, Eff. 3/20/89); [(Amdt. 135–55, Eff. 3/6/95)]

§ 135.170 Materials for compartment interiors.

[(a) No person may operate an airplane that conforms to an amended or supplemental type certificate issued in accordance with SFAR No. 41 for a maximum certificated takeoff weight in excess of 12,500 pounds unless within one year after issuance of the initial airworthiness certificate under that SFAR, the airplane meets the compartment interior requirements set forth in § 25.853(a) in effect March 6, 1995 (formerly § 25.853(a), (b), (b–1), (b–2), and (b–3) of this chapter in effect on September 26, 1978).]

(b) [Except for commuter category airplanes and airplanes certificated under Special Federal Aviation Regulation No. 41, no person may operate a large airplane unless it meets the following additional airworthiness requirements:]*

[(1) Except for those materials covered by paragraph (b)(2) of this section, all materials in each compartment used by the crewmembers or passengers must meet the requirements of § 25.853 of this chapter in effect as follows or later amendment thereto:

[(i) Except as provided in paragraph (b)(1)(iv) of this section, each airplane with a passenger capacity of 20 or more and manufactured after August 19, 1988, but prior to August 20, 1990, must comply with the heat release rate testing provisions of § 25.853(d) of 20 or more and manufactured after August 19, 1990, must comply with the heat release rate and smoke testing provisions of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on September 26, 1988).

[(iii) Except as provided in paragraph (b)(1)(v) or (vi) of this section, each airplane for which the application for type certificate was filed prior to May 1, 1972, must comply with the provisions of § 25.853 in effect on April 30, 1972, regardless of the passenger capacity, if there is a substantially complete replacement of the cabin interior after April 30, 1972.

[(iv) Except as provided in paragraph (b)(1)(v) or (vi) of this section, each airplane for which the application for type certificate was filed after May 1, 1972, must comply with the material requirements under which the airplane was type certificated regardless of the passenger capacity if there is a substantially complete replacement of the cabin interior after that date.

[(v) Except as provided in paragraph (b)(1)(vi) of this section, each airplane that was type certificated after January 1, 1958, must comply with the heat release testing provisions of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on August 20, 1986), if there is a substantially complete replacement of the cabin interior components identified in that paragraph on or after that date, except that the total heat release over the first 2 minutes of sample exposure shall not exceed 100 kilowatt-minutes per square meter and the peak heat release rate shall not exceed 100 kilowatts per square meter.

[(vi) Each airplane that was type certificated after January 1, 1958, must comply with the heat release rate and smoke testing provisions of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on August 20, 1986), if there is a substantially complete replacement of the cabin interior components

nents of the cabin interior that do not meet applicable flammability and smoke emission requirements, if the determination is made that special circumstances exist that make compliance impractical. Such grants of deviation will be limited to those airplanes manufactured within 1 year after the applicable date specified in this section and those airplanes in which the interior is replaced within 1 year of that date. A request for such grant of deviation must include a thorough and accurate analysis of each component subject to § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on August 20, 1986), the steps being taken to achieve compliance, and, for the few components for which timely compliance will not be achieved, credible reasons for such noncompliance.

[(viii) Contrary provisions of this section notwithstanding, galley carts and standard galley containers that do not meet the flammability and smoke emission requirements of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on August 20, 1986), may be used in airplanes that must meet the requirements of paragraph (b)(1)(i), (b)(1)(ii), (b)(1)(iv), or (b)(1)(vi) of this section provided the galley carts or standard containers were manufactured prior to March 6, 1995.

[(2) For airplanes type certificated after January 1, 1958, seat cushions, except those on flight crewmember seats, in any compartment occupied by crew or passengers must comply with the requirements pertaining to fire protection of seat cushions in § 25.853(c) effective November 26, 1984.]

(Amdt. 135–2, Eff. 10/17/79); [(Amdt. 135–55, Eff. 3/6/95)]; [(Amdt. 135–56, Eff. 3/6/95)]*

§ 135.171 Shoulder harness installation at flight crewmember stations.

(a) No person may operate a turbojet aircraft or an aircraft having a passenger seating configuration, excluding any pilot seat, of 10 seats or more unless it is equipped with an approved shoulder

§ 135.173 Airborne thunderstorm detection equipment requirements.

(a) No person may operate an aircraft that has a passenger seating configuration, excluding any pilot seat, of 10 seats or more in passenger-carrying operations, except a helicopter operating under day VFR conditions, unless the aircraft is equipped with either approved thunderstorm detection equipment or approved airborne weather radar equipment.

(b) [No] person may operate a helicopter that has a passenger seating configuration, excluding any pilot seat, of 10 seats or more in passenger-carry operations, under night VFR when current weather reports indicate that thunderstorms or other potentially hazardous weather conditions that can be detected with airborne thunderstorm detection equipment may reasonably be expected along the route to be flown, unless the helicopter is equipped with either approved thunderstorm detection equipment or approved airborne weather radar equipment.

(c) No person may begin a flight under IFR or night VFR conditions when current weather reports indicate that thunderstorms or other potentially hazardous weather conditions that can be detected with airborne thunderstorm detection equipment, required by paragraph (a) or (b) of this section, may reasonably be expected along the route to be flown, unless the airborne thunderstorm detection equipment is in satisfactory operating condition.

(d) If the airborne thunderstorm detection equipment becomes inoperative en route, the aircraft must be operated under the instructions and procedures specified for that event in the manual required by § 135.21.

(e) This section does not apply to aircraft used solely within the State of Hawaii, within the State of Alaska, within that part of Canada west of longitude 130 degrees W, between latitude 70 degrees N, and latitude 53 degrees N, or during any training, test, or ferry flight.

(f) Without regard to any other provision of this part, an alternate electrical power supply is not

(a) No person may operate a large, transport category aircraft in passenger-carrying operations unless approved airborne weather radar equipment is installed in the aircraft.

(b) No person may begin a flight under IFR or night VFR conditions when current weather reports indicate that thunderstorms, or other potentially hazardous weather conditions that can be detected with airborne weather radar equipment, may reasonably be expected along the route to be flown, unless the airborne weather radar equipment required by paragraph (a) of this section is in satisfactory operating condition.

(c) If the airborne weather radar equipment becomes inoperative en route, the aircraft must be operated under the instructions and procedures specified for that event in the manual required by § 135.21.

(d) This section does not apply to aircraft used solely within the State of Hawaii, within the State of Alaska, within that part of Canada west of longitude 130 degrees W, between latitude 70 degrees N, and latitude 53 degrees N, or during any training, test, or ferry flight.

(e) Without regard to any other provision of this part, an alternate electrical power supply is not required for airborne weather radar equipment.

§ 135.177 Emergency equipment requirements for aircraft having a passenger seating configuration of more than 19 passengers.

(a) No person may operate an aircraft having a passenger seating configuration, excluding any pilot seat, of more than 19 seats unless it is equipped with the following emergency equipment:

(1) One approved first aid kit for treatment of injuries likely to occur in flight or in a minor accident, which meets the following specifications and requirements:

(i) Each first aid kit must be dust and moisture proof, and contain only materials that either meet Federal Specifications GGK–319a, as revised, or as approved by the Administrator.

Contents	*Quantity*
Adhesive bandage compressors, 1 in ..	16
Antiseptic swabs	20
Ammonia inhalents	10
Bandage compressors, 4 in	8
Triangular bandage compressors, 40 in	5
Arm splint, noninflatable	1
Leg splint, noninflatable	1
Roller bandage, 4 in	4
Adhesive tape, 1-in standard roll	2
Bandage scissors	1
[Protective latex gloves or equivalent nonpermeable gloves	1 pair]

[(iv) Protective latex gloves or equivalent nonpermeable gloves may be placed in the first aid kit or in a location that is readily accessible to crewmembers.]

(2) A crash axe carried so as to be accessible to the crew but inaccessible to passengers during normal operations.

(3) Signs that are visible to all occupants to notify them when smoking is prohibited and when safety belts must be fastened. The signs must be constructed so that they can be turned on during any movement of the aircraft on the surface, for each takeoff or landing, and at other times considered necessary by the pilot-in-command. "No smoking" signs shall be turned on when required by § 135.127.

(4) (Reserved)

(b) Each item of equipment must be inspected regularly under inspection periods established in the operations specifications to ensure its condition for continued serviceability and immediate readiness to perform its intended emergency purposes.

(Amdt. 135–25, Eff. 4/23/88); (Amdt. 135–43, Eff. 6/30/92); (Amdt. 135–44, Eff. 10/15/92); (Amdt. 135–47, Eff. 1/12/94); [(Amdt. 135–53, Eff. 12/2/94)]

§ 135.178 Additional emergency equipment.

[No person may operate an airplane having a passenger seating configuration of more than 19 seats, unless it has the additional emergency equip-

ground. The assisting means for a floor-level emergency exit must meet the requirements of § 25.809(f)(1) of this chapter in effect on April 30, 1972, except that, for any airplane for which the application for the type certificate was filed after that date, it must meet the requirements under which the airplane was type certificated. An assisting means that deploys automatically must be armed during taxiing, takeoffs, and landings; however, the Administrator may grant a deviation from the requirement of automatic deployment if he finds that the design of the exit makes compliance impractical, if the assisting means automatically erects upon deployment and, with respect to required emergency exits, if an emergency evacuation demonstration is conducted in accordance with § 121.291(a) of this chapter. This paragraph does not apply to the rear window emergency exit of Douglas DC–3 airplanes operated with fewer than 36 occupants, including crewmembers, and fewer than five exits authorized for passenger use.

[(b) *Interior emergency exit marking.* The following must be complied with for each passenger-carrying airplane:

[(1) Each passenger emergency exit, its means of access, and its means of opening must be conspicuously marked. The identity and location of each passenger emergency exit must be recognizable from a distance equal to the width of the cabin. The location of each passenger emergency exit must be indicated by a sign visible to occupants approaching along the main passenger aisle. There must be a locating sign—

[(i) Above the aisle near each over-the-wing passenger emergency exit, or at another ceiling location if it is more practical because of low headroom;

[(ii) Next to each floor level passenger emergency exit, except that one sign may serve two such exits if they both can be seen readily from that sign; and

[(iii) On each bulkhead or divider that prevents fore and aft vision along the passenger cabin, to indicate emergency exits beyond and obscured by it, except that if this is not possible, the sign may be placed at another appropriate location.

continue to be used if its luminescence (brightness) decreases to below 100 microlamberts. The colors may be reversed if it increases the emergency illumination of the passenger compartment. However, the Administrator may authorize deviation from the 2-inch background requirements if he finds that special circumstances exist that make compliance impractical and that the proposed deviation provides an equivalent level of safety.

[(ii) For an airplane for which the application for the type certificate was filed on or after May 1, 1972, each passenger emergency exit marking and each locating sign must be manufactured to meet the interior emergency exit marking requirements under which the airplane was type certificated. On these airplanes, no sign may continue to be used if its luminescence (brightness) decreases to below 250 microlamberts.

[(c) *Lighting for interior emergency exit markings.* Each passenger-carrying airplane must have an emergency lighting system, independent of the main lighting system; however, sources of general cabin illumination may be common to both the emergency and the main lighting systems if the power supply to the emergency lighting system is independent of the power supply to the main lighting system. The emergency lighting system must—

[(1) Illuminate each passenger exit marking and locating sign;

[(2) Provide enough general lighting in the passenger cabin so that the average illumination when measured at 40-inch intervals at seat armrest height, on the centerline of the main passenger aisle, is at least 0.05 foot-candles; and

[(3) For airplanes type certificated after January 1, 1958, include floor proximity emergency escape path marking which meets the requirements of § 25.812(e) of this chapter in effect on November 26, 1984.

[(d) *Emergency light operation.* Except for lights forming part of emergency lighting subsystems provided in compliance with § 25.812(h) of this chapter (as prescribed in paragraph (h) of this section) that serve no more than one assist means, are independ-

[(2) Have a means to prevent inadvertent operation of the manual controls;

[(3) When armed or turned on at either station, remain lighted or become lighted upon interruption of the airplane's normal electric power;

[(4) Be armed or turned on during taxiing, takeoff, and landing. In showing compliance with this paragraph, a transverse vertical separation of the fuselage need not be considered;

[(5) Provide the required level of illumination for at least 10 minutes at the critical ambient conditions after emergency landing; and

[(6) Have a cockpit control device that has an "on," "off," and "armed" position.

[(e) *Emergency exit operating handles.*

[(1) For a passenger-carrying airplane for which the application for the type certificate was filed prior to May 1, 1972, the location of each passenger emergency exit operating handle, and instructions for opening the exit, must be shown by a marking on or near the exit that is readable from a distance of 30 inches. In addition, for each Type I and Type II emergency exit with a locking mechanism released by rotary motion of the handle, the instructions for opening must be shown by—

[(i) A red arrow with a shaft at least three-fourths inch wide and a head twice the width of the shaft, extending along at least 70° of arc at a radius approximately equal to three-fourths of the handle length; and

[(ii) The word "open" in red letters 1 inch high placed horizontally near the head of the arrow.

[(2) For a passenger-carrying airplane for which the application for the type certificate was filed on or after May 1, 1972, the location of each passenger emergency exit operating handle and instructions for opening the exit must be shown in accordance with the requirements under which the airplane was type certificated. On these airplanes, no operating handle or operating handle cover may continue to be used if its luminescence (brightness) decreases to below 100 microlamberts.

Type I or Type II emergency exit to allow a crewmember to assist in the evacuation of passengers without reducing the unobstructed width of the passageway below that required in paragraph (f)(1) of this section; however, the Administrator may authorize deviation from this requirement for an airplane certificated under the provisions of part 4b of the Civil Air Regulations in effect before December 20, 1951, if he finds that special circumstances exist that provide an equivalent level of safety.

[(3) There must be access from the main aisle to each Type III and Type IV exit. The access from the aisle to these exits must not be obstructed by seats, berths, or other protrusions in a manner that would reduce the effectiveness of the exit. In addition, for a transport category airplane type certificated after January 1, 1958, there must be placards installed in accordance with 25.813(c)(3) of this chapter for each Type Ill exit after December 3, 1992.

[(4) If it is necessary to pass through a passageway between passenger compartments to reach any required emergency exit from any seat in the passenger cabin, the passageway must not be obstructed. Curtains may, however, be used if they allow free entry through the passageway.

[(5) No door may be installed in any partition between passenger compartments.

[(6) If it is necessary to pass through a doorway separating the passenger cabin from other areas to reach a required emergency exit from any passenger seat, the door must have a means to latch it in the open position, and the door must be latched open during each takeoff and landing. The latching means must be able to withstand the loads imposed upon it when the door is subjected to the ultimate inertia forces, relative to the surrounding structure, listed in § 25.561(b) of this chapter.

[(g) *Exterior exit markings.* Each passenger emergency exit and the means of opening that exit from the outside must be marked on the outside of the airplane. There must be a 2-inch colored band outlining each passenger emergency exit on the side of the fuselage. Each outside marking, including the band, must be readily distinguishable

tance of the lighter color must be provided.

[(3) Exits that are not in the side of the fuselage must have the external means of opening and applicable instructions marked conspicuously in red or, if red is inconspicuous against the background color, in bright chrome yellow and, when the opening means for such an exit is located on only one side of the fuselage, a conspicuous marking to that effect must be provided on the other side. "Reflectance" is the ratio of the luminous flux reflected by a body to the luminous flux it receives.

[(h) *Exterior emergency lighting and escape route.*

[(1) Each passenger-carrying airplane must be equipped with exterior lighting that meets the following requirements:

[(i) For an airplane for which the application for the type certificate was filed prior to May 1, 1972, the requirements of § 25.812 (f) and (g) of this chapter in effect on April 30, 1972.

[(ii) For an airplane for which the application for the type certificate was filed on or after May 1, 1972, the exterior emergency lighting requirements under which the airplane was type certificated.

[(2) Each passenger-carrying airplane must be equipped with a slip-resistant escape route that meets the following requirements:

[(i) For an airplane for which the application for the type certificate was filed prior to May 1, 1972, the requirements of § 25.803(e) of this chapter in effect on April 30, 1972.

[(ii) For an airplane for which the application for the type certificate was filed on or after May 1, 1972, the slip-resistant escape route requirements under which the airplane was type certificated.

[(i) *Floor level exits.* Each floor level door or exit in the side of the fuselage (other than those leading into a cargo or baggage compartment that is not accessible from the passenger cabin) that is 44 or more inches high and 20 or more inches

[(j) *Additional emergency exits.* Approved emergency exits in the passenger compartments that are in excess of the minimum number of required emergency exits must meet all of the applicable provisions of this section, except paragraphs (f)(1), (2), and (3) of this section, and must be readily accessible.

[(k) On each large passenger-carrying turbojet-powered airplane, each ventral exit and tailcone exit must be—

[(1) Designed and constructed so that it cannot be opened during flight; and

[(2) Marked with a placard readable from a distance of 30 inches and installed at a conspicuous location near the means of opening the exit, stating that the exit has been designed and constructed so that it cannot be opened during flight.

[(l) *Portable lights.* No person may operate a passenger-carrying airplane unless it is equipped with flashlight stowage provisions accessible from each flight attendant seat.]

[(Amdt. 135–43, Eff. 6/3/92)]

§ 135.179 Inoperable instruments and equipment.

(a) No person may take off an aircraft with inoperable instruments or equipment installed unless the following conditions are met:

(1) An approved Minimum Equipment List exists for that aircraft.

(2) The [certificate-holding district office] has issued the certificate holder operations specifications authorizing operations in accordance with an approved Minimum Equipment List. The flight crew shall have direct access at all times prior to flight to all of the information contained in the approved Minimum Equipment List through printed or other means approved by the Administrator in the certificate holders operations specifications. An approved Minimum Equipment List, as authorized by the operations specifications, constitutes an approved change to the type design without requiring recertification.

(3) The approved Minimum Equipment List must:

available to the pilot.

(5) The aircraft is operated under all applicable conditions and limitations contained in the Minimum Equipment List and the operations specifications authorizing use of the Minimum Equipment List.

(b) The following instruments and equipment may not be included in the Minimum Equipment List:

(1) Instruments and equipment that are either specifically or otherwise required by the airworthiness requirements under which the airplane is type certificated and which are essential for safe operations under all operating conditions.

(2) Instruments and equipment required by an airworthiness directive to be in operable condition unless the airworthiness directive provides otherwise.

(3) Instruments and equipment required for specific operations by this part.

(c) Notwithstanding paragraphs (b)(1) and (b)(3) of this section, an aircraft with inoperable instruments or equipment may be operated under a special flight permit under §§ 21.197 and 21.199 of this chapter.

(Amdt. 135–39, Eff. 6/20/91); [(Amdt. 135–60, Eff. 2/26/96)]

§ 135.180 Traffic alert and collision avoidance system.

(a) [Unless otherwise authorized by the Administrator, after December 31, 1995, no person may operate a turbine-powered airplane that has a passenger seat configuration, excluding any pilot seat, of 10 to 30 seats unless it is equipped with an approved traffic alert and collision avoidance system. If a TCAS II system is installed, it must be capable of coordinating with TCAS units that meet TSO C–119.]

(b) The airplane flight manual required by § 135.21 of this part shall contain the following information on the TCAS I system required by this section:

(1) Appropriate procedures for—

§ 135.181 Performance requirements: Aircraft operated over-the-top or in IFR conditions.

(a) Except as provided in paragraphs (b) and (c) of this section, no person may—

(1) Operate a single-engine aircraft carrying passengers over-the-top or in IFR conditions; or

(2) Operate a multiengine aircraft carrying passengers over-the-top or in IFR conditions at a weight that will not allow it to climb, with the critical engine inoperative, at least 50 feet a minute when operating at the MEAs of the route to be flown or 5,000 feet MSL, whichever is higher.

(b) Notwithstanding the restrictions in paragraph (a)(2) of this section, multiengine helicopters carrying passengers offshore may conduct such operations in over-the-top or in IFR conditions at a weight that will allow the helicopter to climb at least 50 feet per minute with the critical engine inoperative when operating at the MEA of the route to be flown or 1,500 feet MSL, whichever is higher.

(c) Without regard to paragraph (a) of this section—

(1) If the latest weather reports or forecasts, or any combination of them, indicate that the weather along the planned route (including takeoff and landing) allows flight under VFR under the ceiling (if a ceiling exists) and that the weather is forecast to remain so until at least 1 hour after the estimated time of arrival at the destination, a person may operate an aircraft over-the-top; or

(2) If the latest weather reports or forecasts, or any combination of them, indicate that the weather along the planned route allows flight under VFR under the ceiling (if a ceiling exists) beginning at a point no more than 15 minutes flying time at normal cruise speed from the departure airport, a person may—

(i) Take off from the departure airport in IFR conditions ''and fly in IFR conditions to a point no more than 15 minutes flying time at normal cruise speed from that airport;

tion, a person may operate an aircraft over-the-top under conditions allowing—

(1) For multiengine aircraft, descent or continuance of the flight under VFR if its critical engine fails; or

(2) For single-engine aircraft, descent under VFR if its engine fails.

(Amdt. 135–20, Eff. 1/6/87)

§ 135.183 Performance requirements: Land aircraft operated over water.

No person may operate a land aircraft carrying passengers over water unless—

(a) It is operated at an altitude that allows it to reach land in the case of engine failure;

§ 135.185 Empty weight and center of gravity: Currency requirement.

(a) No person may operate a multiengine aircraft unless the current empty weight and center of gravity are calculated from values established by actual weighing of the aircraft within the preceding 36 calendar months.

(b) Paragraph (a) of this section does not apply to—

(1) Aircraft issued an original airworthiness certificate within the preceding 36 calendar months; and

(2) Aircraft operated under a weight and balance system approved in the operations specifications of the certificate holder.